

### **REMARKS**

Claims 1, 3-7, 10-15, 17-20, 25, 28, and 30-34 were previously pending in this application. Independent claims 1, 20, and 25 have been amended. Support for the amendments to these claims is provided at, for example, FIG. 1 and the discussion thereof, e.g. at paragraphs [0050] and [0058] of the present application as published (U.S. Patent Pub. No. 2007/0181496). No claims are currently cancelled. As a result, claims 1, 3-7, 10-15, 17-20, 25, 28, and 30-34 are pending for examination with claims 1, 20, and 25 being independent claims. No new matter has been added.

#### **Rejections Under 35 U.S.C. §103**

In the Final Office Action mailed June 26, 2009, claims 1, 3-7, 10, 17-18, 20-23, 25 and 28, and 30-34 were rejected under 35 U.S.C. §103(a) as being unpatentable over Daly et al. (U.S. Patent No. 6,120,688), hereinafter “Daly,” in view of Al-Samadi et al. (U.S. Patent No. 5,501,798), hereinafter “Al-Samadi.”

In the Advisory Action mailed October 19, 2009, the Examiner indicated that the amendments and arguments presented in Applicant’s Response filed August 25, 2009 were entered, but that the arguments presented did not place the application in condition for allowance because said arguments were previously addressed in the Final Office Action.

Applicant disagrees that independent claims 1, 20, and 25, as currently amended, would have been obvious to one of ordinary skill in the art over the teaching of Daly in view of Al-Samadi.

There is no *prima facie* case of obviousness of any of independent claims 1, 20, and 25, as amended, or the claims that depend from these claims over Daly in view of Al-Samadi. The asserted combination of these references fails to disclose each and every element of any of the claims of the present application.

Daly fails to disclose or suggest, for example, “providing a filtration system including a primary microfiltration or ultrafiltration unit and a reverse osmosis unit,” “providing a backwash system separate from the filtration system, the backwash system including a secondary microfiltration or ultrafiltration membrane filter,” “filtering the residual reverse osmosis stream [i.e. retentate from the reverse osmosis unit] by passing the stream through the secondary microfiltration or ultrafiltration membrane filter to produce a filtered saline solution; and backwashing the primary microfiltration or ultrafiltration unit with the filtered saline solution” as

recited in independent claim 1. Rather, in Daly, the 10 micron filter 54 (which the Examiner equates with the claimed “secondary microfiltration or ultrafiltration membrane filter”) is present in both the filtration system (the flow path from the feed pump 6 through the filtration tank 14, and through lines 36, 37, and 52 to the reverse osmosis units 70 and 90) and in the backwash system (the flow path from the CIP tank 100 through lines 104, 52, 112, 37, and 36 to the membrane filters 20). In Daly, there is no “secondary microfiltration or ultrafiltration membrane filter” present in any backwash system separate from a filtration system.

Daly fails to disclose or suggest “providing a first fluid circuit configured to direct the impure filtered water [from a primary microfiltration or ultrafiltration unit] to a reverse osmosis unit in downstream fluid communication from said primary microfiltration or ultrafiltration unit” and “providing a second fluid circuit configured to direct a residual reverse osmosis stream from the reverse osmosis unit to a secondary microfiltration or ultrafiltration unit to produce a filtered saline solution, the second fluid circuit separate from the first fluid circuit” as recited in independent claim 20. Rather, in Daly, the 10 micron filter 54 is present in fluid line 52 through which water filtered through the membrane filters 20 passes on its way to the reverse osmosis units. There is no other filter, let alone a “secondary microfiltration or ultrafiltration membrane filter” present in any fluid circuit separate from the fluid circuit through which water filtered through the membrane filters 20 passes which is used to direct a residual reverse osmosis stream (i.e. a retentate) from the reverse osmosis units back to the membrane filters 20 for backwashing.

Daly also fails to disclose or suggest “a backwash system, separate from [a] filtration system, in fluid communication with a residual reverse osmosis stream outlet of the reverse osmosis unit and a permeate outlet of the primary microfiltration or ultrafiltration unit, and including: a secondary microfiltration or ultrafiltration membrane filter to filter the residual reverse osmosis stream to produce a filtered saline solution; and a controllable fluid pathway directing the filtered saline solution to backwash the primary microfiltration or ultrafiltration unit” as recited in independent claim 25 for at least the same reasons discussed above with regard to independent claims 1 and 20.

The teaching of Al-Samadi does not cure the deficiencies of Daly to disclose or suggest the subject matter claimed in any of independent claims 1, 20, and 25. The teaching of Al-Samadi does not disclose backwashing of a primary microfiltration or ultrafiltration unit, let alone by passing retentate from a reverse osmosis module through a secondary microfiltration or

ultrafiltration unit in a backwash system separate from a filtration system prior to using the retentate to backwash the primary microfiltration or ultrafiltration unit. Al-Samadi only teaches recycling of the filtrate or retentate from a microfiltration or ultrafiltration unit in the system, using various chemical agents to prevent fouling and scaling of the filtration units, and controlling the rate of removal of retentate to control precipitation. The retentate of the reverse osmosis membrane is not used to backwash a primary microfiltration or ultrafiltration unit as presently claimed, and is instead disposed of as a filter cake, or recycled to the source of waste water.

If the asserted combination of Daly with Al-Samadi were made, the resulting combination would be the system of Daly with the 10 micron filter 54 replaced with the ultrafiltration/microfiltration cartridge filter 24 of Al-Samadi. This asserted combination would not include each element of any of independent claims 1, 20, or 25 because this combination would still lack a “secondary microfiltration or ultrafiltration membrane filter” present in a backwash system separate from a filtration system. To make a modification to the apparatus of Daly to include this feature would require the addition of a microfiltration or ultrafiltration membrane filter in a portion of a fluid circuit used in a backwash process, but not in a filtration process. There is no disclosure or suggestion in either Daly or Al-Samadi that would have led one of ordinary skill in the art to have made such a modification to Daly.

The differences between the claimed methods and systems from what is disclosed in Daly are patentably significant. For example, in the claimed systems and methods, the secondary microfiltration or ultrafiltration membrane filter is present in a fluid circuit separate from that through which liquid undergoing filtration through the primary microfiltration or ultrafiltration membrane filter and through the reverse osmosis unit passes. As such, the secondary microfiltration or ultrafiltration membrane filter may be serviced, replaced, or backwashed without interrupting the filtration of water through the primary microfiltration or ultrafiltration membrane filter and reverse osmosis unit. In contrast, the 10 micron filter 54 of Daly is present in both the filtration and backwash streams of the apparatus disclosed, and could not be replaced or backwashed without interrupting the filtration process, backwash process, or both of Daly.

Accordingly, there is no *prima facie* case of obviousness of independent claims 1, 20, and 25 over Daly in view of Al-Samadi because the asserted combination of these references fails to disclose or suggest each and every element of any of these claims. Ergo, independent claims 1,

20, and 25 are patentable over Daly in view of Al-Samadi. For at least the same reasons, dependent claims 3-7, 10, 17-18, and 28, and 30-34, which depend directly or indirectly from independent claims 1 and 25, are also patentable over Daly in view of Al-Samadi.

Accordingly, reconsideration and withdrawal of the rejection of claims 1, 3-7, 10, 17-18, 20, 25, and 28, and 30-34 under 35 U.S.C. § 103(a) over Daly in view of Al-Samadi is respectfully requested.

Dependent claims 11-15, 19 and 34 were rejected under 35 U.S.C. §103(a) as being unpatentable over Daly in view of Al-Samadi, as applied to claims 1 and 25, and further in view of Water Encyclopedia (Jay Lehr, editor, John Wiley & Sons, Inc., New York, 2005, hereinafter "Encyclopedia").

Applicant disagrees that dependent claims 11-15, 19, and 34 would have been obvious to one of ordinary skill in the art over Daly in view of Al-Samadi, as applied to independent claims 1 and 25. The rejection of dependent claims 11-15, 19, and 34 is improper because no *prima facie* case of obviousness has been established. The asserted combination of references lacks at least one element recited in each of these claims.

The Encyclopedia teaches generally methods and treatments of purifying water. The various chemical, radiation, and physical treatments taught in Encyclopedia are intended to further purify the stream to provide drinkable water. The deficiencies of Daly in view of Al-Samadi to render obvious the subject matter of any of the claims of the present application are not cured by the teaching of Encyclopedia. The Encyclopedia does not disclose, teach or suggest a method, as recited in dependent claims 11-15, and 19, or a system, as recited in dependent claim 34 including the claim elements recited in independent claim 1 and 25, discussed above, which are not disclosed or suggested by Daly in view of Al-Samadi. Therefore, Daly in view of Al-Samadi, and further in view of Encyclopedia, fails to disclose each and every element of any of dependent claims 11-15, 19, and 34.

Thus, dependent claims 11-15, 19, and 34 cannot have been obvious over the teaching of Daly in view of Al-Samadi, as applied to independent claims 1 and 25, and further in view of the Encyclopedia.

Accordingly, reconsideration and withdrawal of the rejection of dependent claims 11-15, 19, and 34 under 35 U.S.C. § 103(a) over Daly in view of Al-Samadi and further in view of the Encyclopedia is respectfully requested.

### **CONCLUSION**

In view of the foregoing amendments and remarks, reconsideration is respectfully requested. This application should now be in condition for allowance; a notice to this effect is respectfully requested. If the Examiner believes, after this amendment, that the application is not in condition for allowance, the Examiner is requested to call the Applicant's attorney at the telephone number listed below.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 50/2762 (Ref. No. M2019-7022US).

Respectfully submitted,  
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